Appendix A

State of Wisconsin

CORRESPONDENCE/MEMORANDUM

DATE: February 19, 2004 FILE REF: 2480

TO: Bob Mather, Jim Warren

FROM: Jane Cummings Carlson, Colleen Matula, Joe Kovach

SUBJECT: Brule River State Forest Master Plan Variance and Two-lined Chestnut Borer

You requested that we critically review the draft BRSF variance and provide constructive comments and recommendations. The variance and supporting information are well developed. However, the current draft will need to be redrafted for two reasons:

1. It is already too late to complete salvage operations before spring 2004; timing of operations needs to be redefined; the stands will need to be reevaluated due to potential additional mortality and may need to be remarked.
2. Improve language and organization to clarify details, considerations, and methods.

Modifications/considerations related to the two-lined chestnut borer and health status of existing and adjoining stands:

1. The current draft and supporting information state that recommended management actions are necessary to "control the spread" of the two-lined chestnut borer or "prevent further spread". This language should be changed to "reduce the number of emerging adults of the two-lined chestnut borer on the site".

   The two-lined chestnut borer, *Agrilus bilineatus*, overwinters in a pupal cell in the outer bark as a forth instar. This insect will emerge in late May to early June. Cutting infested trees and removing them from the stand before emergence in 2004 will reduce the number of adults on the site. There has not been a controlled study on what level of removal is necessary to make a significant impact on the health of a forest stand. Factors affecting the effectiveness of this management practice include level of precipitation, defoliation and population of the two-lined chestnut borer off site. If precipitation is below normal, borer populations high in areas surrounding the site and defoliation or frost injury occurs, residual oaks will be very vulnerable to infestation and continue to decline in spite of removal of infested trees. If precipitation returns to average or above levels (especially during the spring), borer populations are low in surrounding woodlands and no defoliation or frost injury occurs, removal of infested oaks could reduce the risk of further infestation to residual seed trees and trees on neighboring properties.

2. In addition, following the previous discussion, the impact of salvage on the health of adjoining stands is uncertain. Thus, references to preventing the extension of the infestation into "adjoining healthy stands" should clearly state that this "could" be a result of salvage.

3. The supporting documentation states stump sprouts will be a source of regeneration in salvaged stands. Stump sprouting may be minimal from trees where more than 75% of the crown was dead at the end of the 2003-growing season. There is a significant reduction in starch reserves in trees infested by the two-lined chestnut borer. If the marking took this into consideration, it is not an issue. If trees with significant dieback are being considered as sources of stump sprouts, management practices should be reconsidered.

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4. If there is no salvage, and the infested trees are left for another growing season, several other insects are likely to infest the dead and dying trees and reduce their monetary value.

   Dr. Robert Haack conducted research on the insects in Wisconsin that infest oak in concert with or after the two-lined chestnut borer. Species in the families Buprestidae, Scolytidae and Cerambycidae are all likely to bore into the dead trees at various depths. Some will have a minor effect on the product; some could cause significant degradation.

5. Although winter harvesting is recommended, summer harvesting is acceptable in Area 8 where soils are coarse and dry and the topography gentle. Summer harvesting could place additional stress on residual oaks if healthy trees are removed, exposing the site to additional sunlight and heat.

Additional specific suggested modifications and considerations:

A. The Approval – Suggested rewording
   - "In Area 2, on up to 40 acres, a modified group seed tree with reserves and supplemental planting regeneration method and harvest is authorized to salvage the dead and dying oak, encourage oak regeneration, and attempt to reduce the number of emerging adults of the two-lined chestnut borer on the site. Site preparation, planting (mostly oak), and release treatments are authorized to facilitate regeneration."
     - Consider a modified two-stage shelterwood with group retention, reserves, and supplemental planting.
   - "In Area 8, on up to 75 acres, the following regeneration methods and harvests are authorized to salvage the dead and dying oak, encourage oak and jack pine regeneration, and attempt to reduce the number of emerging adults of the two-lined chestnut borer on the site: 1) a modified group seed tree with reserves and supplemental planting, and 2) clearcut and plant. The selection and application of each method will depend on site potential and stand condition. Site preparation, planting (mostly oak and jack pine), and release treatments are authorized to facilitate regeneration."

B. Purpose and need …
   - Cutting will not be completed by spring 2004.
   - Provide additional organized detail relative to surveys and marking. Specify levels of mortality and crown dieback, and methods to evaluate. Specify the dates of individual surveys and stand evaluation and marking.
   - Remove the reference to stand age relative to stress and health.

C. Area 2
   - The recommendations are well developed. The winter only logging restriction and the proximity of spring will prevent the implementation of salvage until next winter. The stands will need to be reevaluated next August and marking may need to be adjusted.
   - Good detail on level of mortality and dieback. Specify timing of stand evaluation and marking.
   - The salvage may not be necessary to "create full sunlight conditions that favor oak regeneration" unless there are many remaining healthy trees to provide shade. Oak mortality should result in a significant increase in sunlight reaching the forest floor. More important factors are seed availability, sprouting ability, suitable seedbed, and competition control.

- The recommended group seed tree with reserves and supplementary planting is a viable silvicultural choice considering the situation. Specify plans for removing (or not) the remaining overstory.
  - Consider a two-stage shelterwood with group retention, reserves, and supplementary planting. This would involve the additional retention of some scattered oak and white birch for seed, red maple for seed and to reduce sprouting, and most aspen to reduce suckering. The entire overstory except reserves would be removed in 3-8 years (following the initial cut/salvage) depending on mortality and regeneration.
- Consider planting some white pine in addition to oak.
- Remove references to Douglas County. The potential sanitation cause and effect on adjoining stands has not been proven and is therefore conjectural.

D. Area 8
- Specify the level of mortality and dieback. Specify timing of stand evaluation and marking.
- The current plan is somewhat confusing relative to when to regenerate oak versus jack pine. The decision making process should be clarified and organized. Discuss each scenario individually.
  - Consider applying practices similar to Area 2 to regenerate oak (and some white pine) on high site index PArVAa-Po sites, and planting jack pine on lower site index PArV-U sites.

Considering the significant mortality occurring in these stands, the planned salvage operations are sensible forest management. The primary benefits of salvage in these stands are:
1. Recover economic value that would otherwise be lost.
2. Facilitate the implementation of forest regeneration practices that respond to environmental events and meet management goals and objectives. If targeted regeneration practices are not implemented, then regeneration may be delayed (perhaps for a significantly long time period) and future species composition may be undesirable.
3. Reduce the number of emerging adults of two-lined chestnut borer on site. Although impacts on the health of remaining trees and adjacent stands are uncertain, there could be positive benefits.

We hope that these comments are clear and helpful. If you have any questions or concerns, please feel free to contact us.

Cc: Tim Mulhern
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